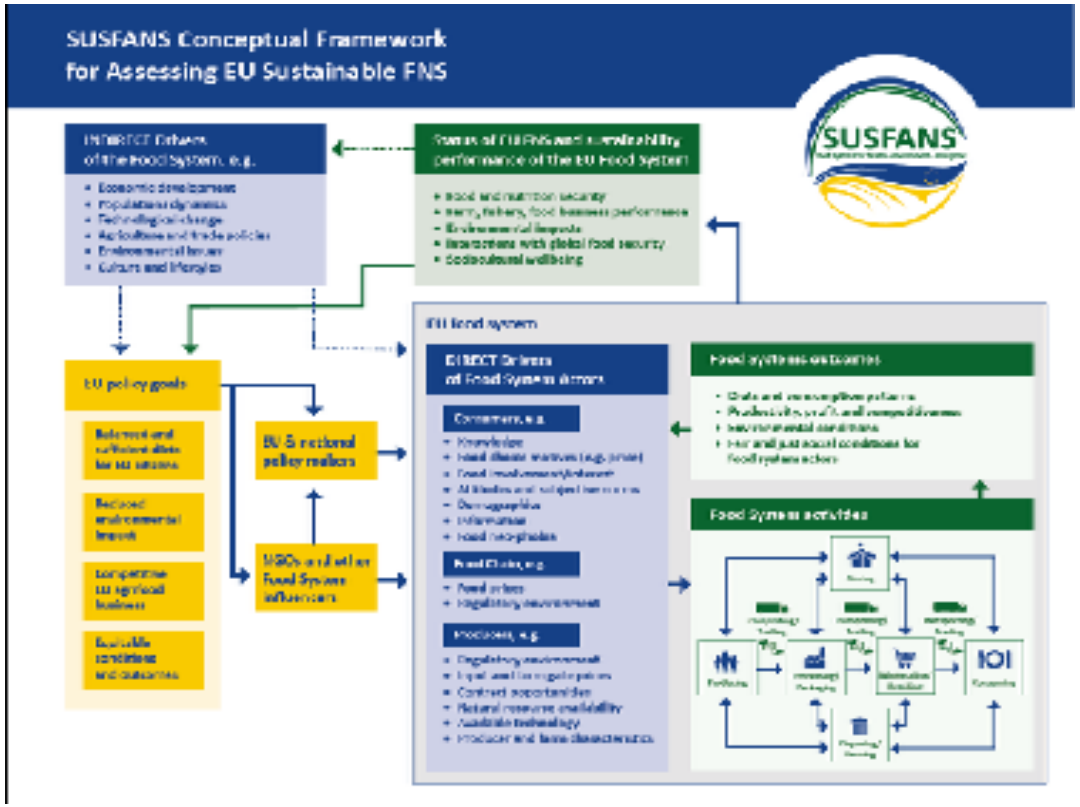
Brief review of main achievements of Pillar 1

(WP1-4) : Assessing sustainable food and nutrition security (FNS)

WP 1 – Conceptual framework and FNS sustainability metrics

- Develop **conceptual and methodological frameworks** for the quantitative assessment of sustainable FNS (WPs 2-4) for a range of time frames in the EU



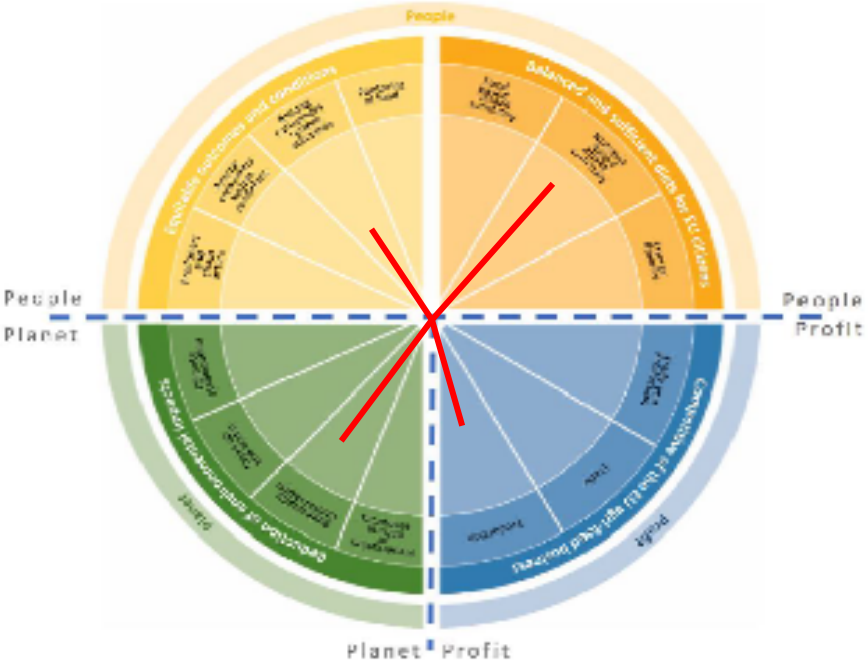
- **Develop an integrated set of sustainability metrics for assessing EU food and nutrition security**

- **look across all sustainability dimensions/policy goals** at the same time
- **assess changes to the food system's performance** when introducing innovations
- Visualize **synergies and trade-offs across policy goals**

Spider diagramm

- Where do we stand as regards each policy goal?

- Where we would be in different scenarios?



WP2 – Drivers and data: food consumption and diets

A comparison of dietary intakes across four EU countries (CZ, DK, FR and IT)

European Journal of Nutrition
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ORIGINAL CONTRIBUTION

Geographic and socioeconomic diversity of food and nutrient intakes: a comparison of four European countries

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- The set of food-based dietary guideline (FBDG) was not met by a large part of the population and/or population subgroup.
- Within countries, food intakes varied by socio-economic factors, but less pronounced by overweight status.
- In all countries, intakes were low for legumes, and nuts and seeds, but high for red and processed meat.

Consumers' trade-offs : role of prices and information

- Consumer perceptions of sustainability and drivers of change were explored in experimental settings.

- **Consumer information including labelling can be seen as supportive policies** for a shift in consumer behaviour but evidence varies on the targeting of health and sustainability information to consumers:

  - the sustainability information provided little benefit over health information in an experiment on a soy-based meat substitute (Marette, 2017);

  - consumers preferred combined health and sustainability information in a choice experiment on fruit and vegetables products (Bouwman et al., 2018).

- Both experiments suggest **the importance of price drivers** in steering towards healthier dietary choices.

Which dietary recommendations must be prioritized? (D2.6)

Assessing the effects of the adoption of dietary recommendations by consumers in France, Denmark, Finland

Take into account:

- **Consumers' preferences and their effects on substitutions** induced by the adoption of some dietary recommendations

- **Change in consumer welfare** associated to the adoption of dietary recommendations

- **Public health and environmental** (GHGEs) impacts

Our approach

Matching:

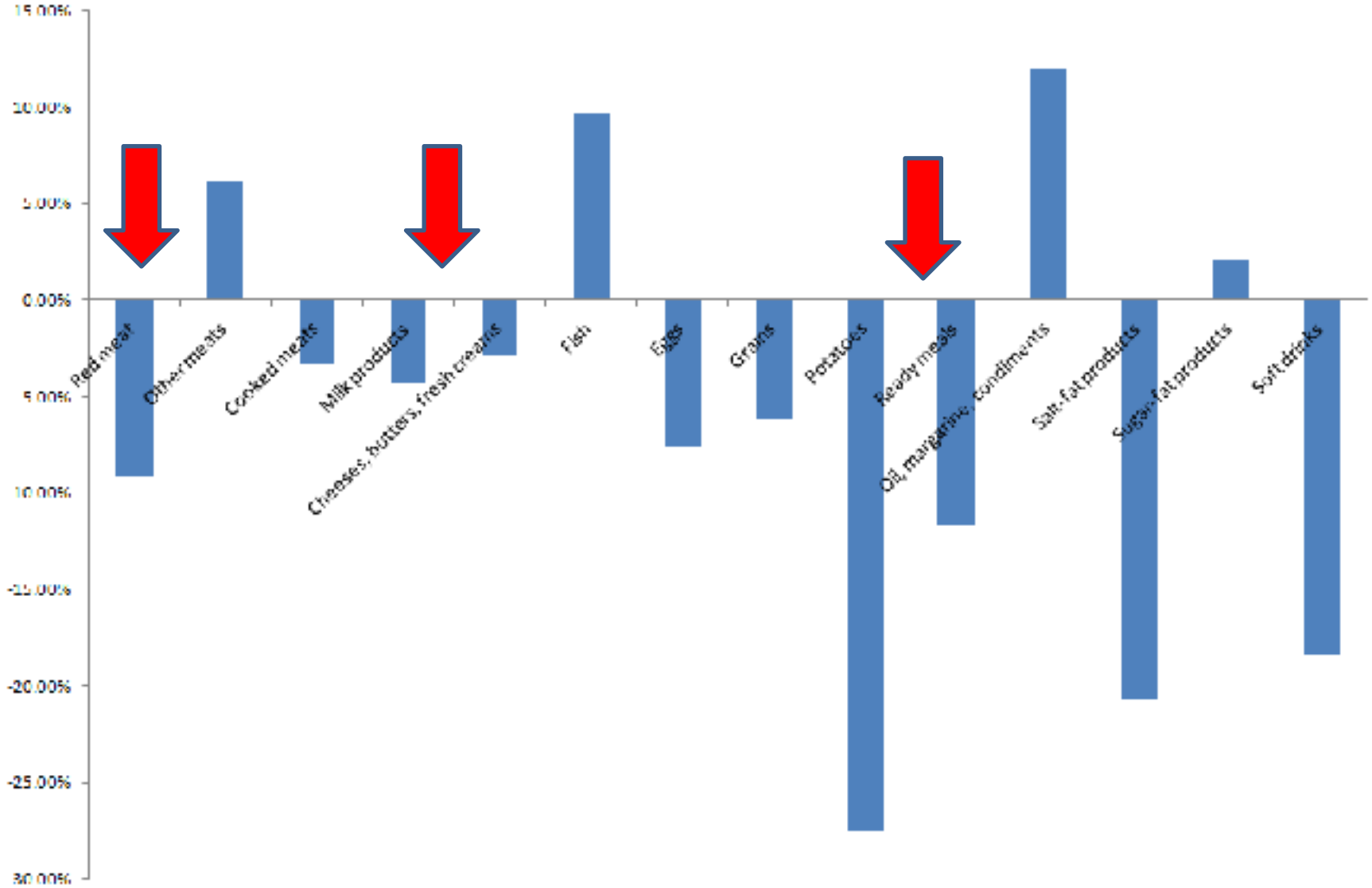
• **An economic model** (Irz et al., 2015) to predict how whole diets would change if consumers comply with a given recommendation

• **An epidemiological model** (Scarborough et al. 2012) to estimate the health impacts (number of deaths avoided) due to the dietary change

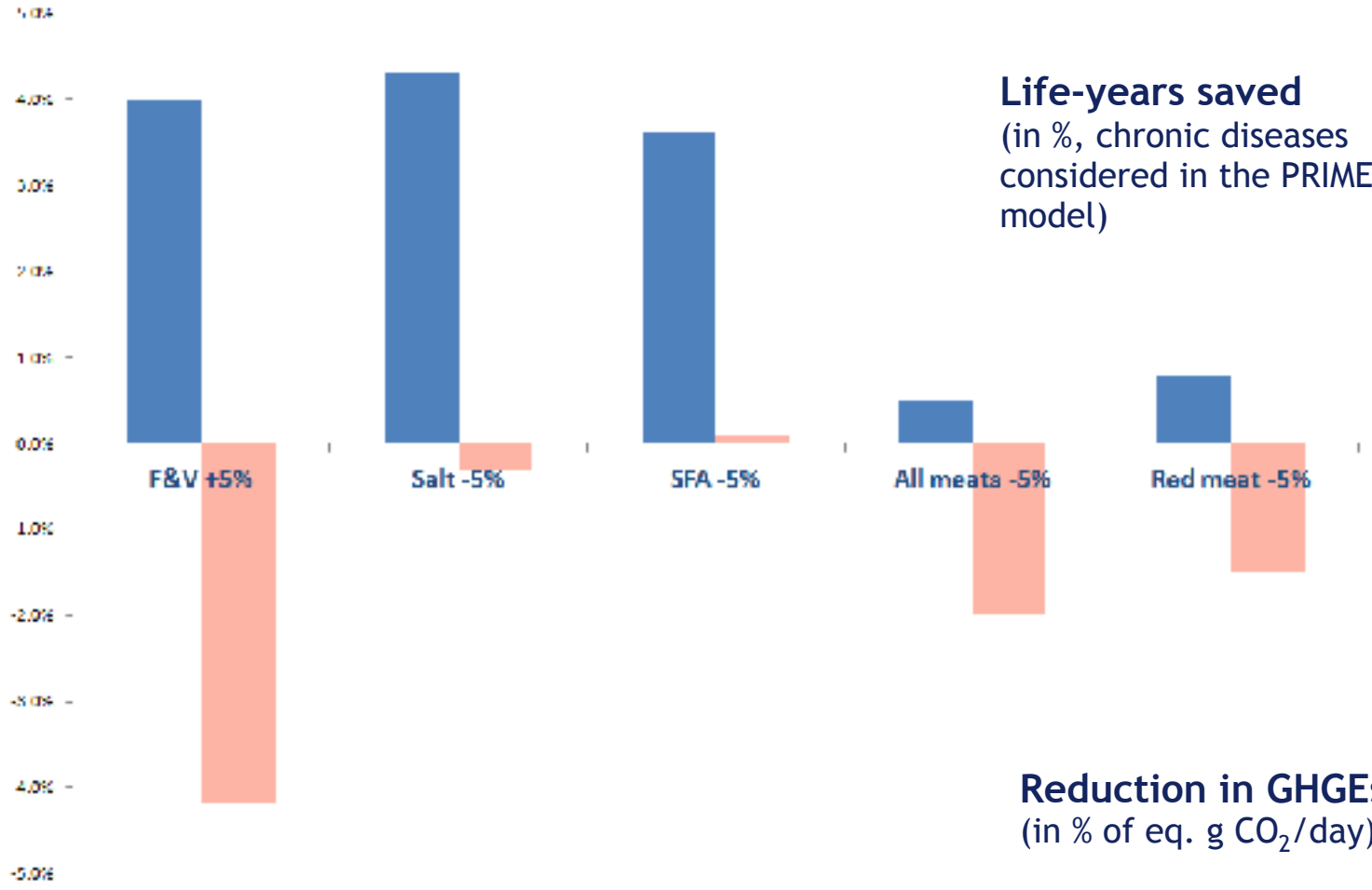
• An **environmental model** to estimate the change in the diet-related GHGEs induced by the dietary changes

⇨ Cost-effectiveness of dietary recommendations taking into account **health and environmental benefits** and the **costs for the consumers** to comply

Changes in the diet induced by a 5% increase in F&V intake (intermediary income group, France)



Health and environmental impacts of dietary changes associated with the adoption of dietary recommendations (+/- 5%)



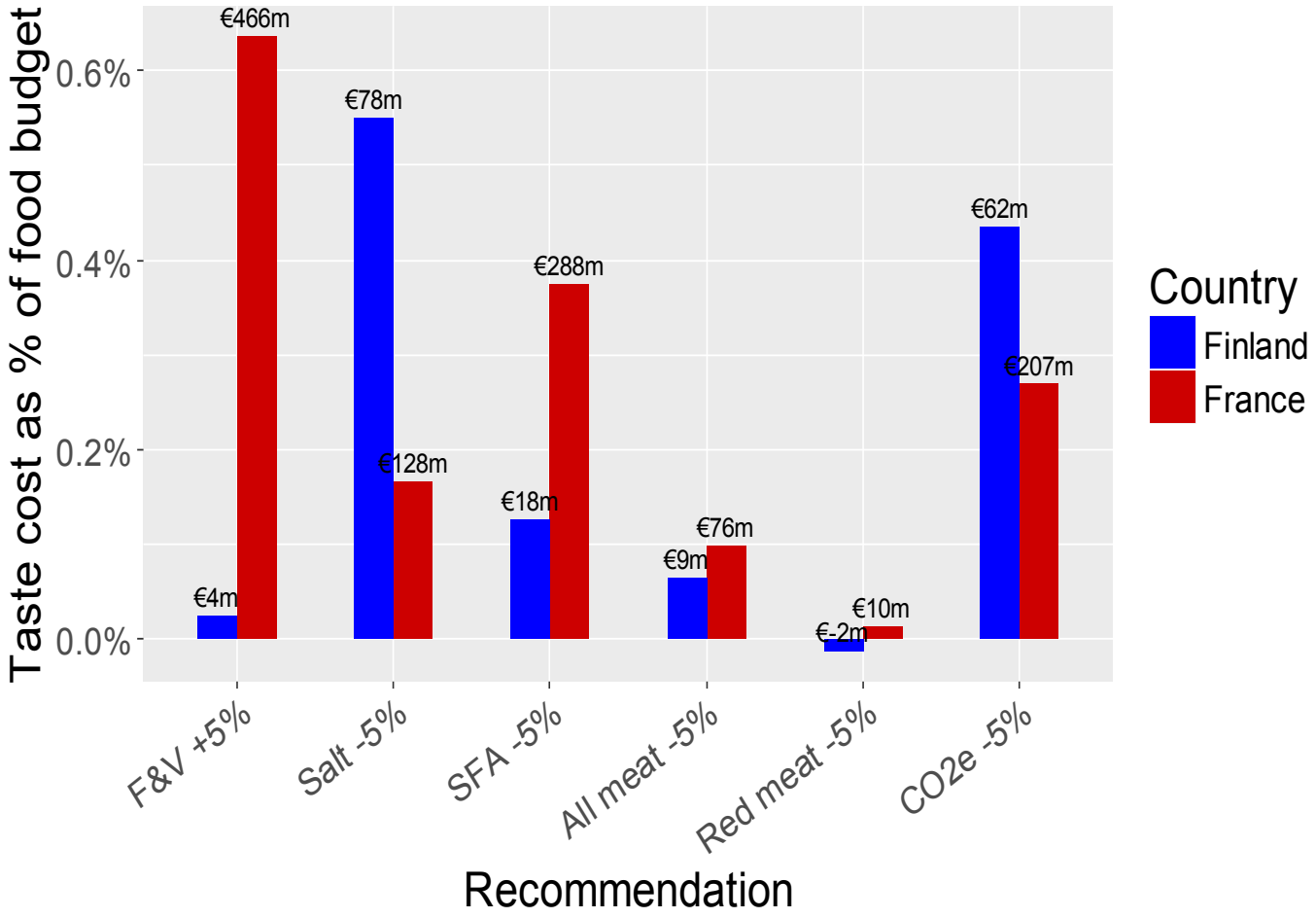
- F&V rec. (+5%): significant effects on health and GHGEs
- Red meat rec. (-5%): small impact on health, moderate impact on GHGEs

Benefit-cost assessment of dietary recommendations

Economic value of health and environmental benefits	? >	Policy cost + variation of consumer welfare (taste cost)

Maximum amount of budget a public authority can devote to promote the recommendation while keeping the policy cost-effective

Difficulty of Adjustment: Taste Costs



• Differences in consumers' preferences across countries = high variability of taste costs

Main conclusions

- *What are the impacts on the whole diets?*
  - Large but country specific
  - Importance of behavioral adjustments to understand impacts
  - Importance of taste costs (=difficulty of consumers to comply with reco.)

- *Which recommendations to prioritize* ?
  - Promotion of some dietary recommendations looks socially desirable
  - F&V, Salt and SFA highly recommended

- *Are health and environmental objectives compatible ?*
  - Yes, but not systematic
  - Climate benefits relatively small compared to health benefits

- *Can we extrapolate results from one country to another one ?*
  - Given consumers' preferences and current consumption patterns, recommendations must be adapted according to the countries

WP 3 – Drivers and data: food chain actors

Objectives

- Better understand the effect of market power on the **economic sustainability** of food supply chains
- Better understand the **determinants and impacts of private and public food standards**

Drivers

• Better understand the **environmental sustainability of food chains** by analyzing **biomass streams and emissions in the post-farm food chain**

Data

The role of market power in the EU food supply chain (D.3.5/D. 3.6):

- Extensive debate on the position of farmers in the food chain (Falkovski et al. 2017).
- **Market concentration and technological advances** are claimed to have shifted the balance of power in the food system to global retailers and other concentrated sectors.

- An **extensive empirical study** was done into the functioning of selected EU supply chains in France and Italy
- The results show that **farmers have a significantly higher volatility of mark-ups** compared to other agents in food value chains, such as food processors, wholesalers and retailers (Garrone and Swinnen, 2018).

Table 1: Mark-up volatility of sectors of the food chain

	France		Italy	
	Volatility	p-value	Volatility	p-value
Agriculture	0.18		0.18	
Food Processing	0.05	0.00	0.08	0.00
Drink	0.12	0.00	0.09	0.00
Food Wholesale	0.05	0.00	0.05	0.00
Food Retail	0.04	0.00	0.03	0.00

Note: The reported p-values are the result of the t-test comparing agricultural sector against the other sectors.

Economic dimension and functioning of the food supply chain
Setting Food Standards (D.3.1/3.2)

Sheds light on the three issues on the topic of food standards, value chain and sustainability :

a) **Relationships between food standards and sustainability**, establishing a classification of sustainability standards and their effects;

b) economic sustainability of value chains, defined as the ability to withstand changes and shocks from the economic environment ; **vertical coordination between farmers an buyers is needed to achieve economic sustainability** of value chain

c) the political economy of public/private food standards and **the role of the different stakeholders (private and public) in the setting-standard process**.

Firms' strategies in food innovation and reformulation and their responses to nutritional policies (D.3.4)

- Food reformulation (decrease in salt, fat, sugar… contents in foods) **may have significant effects on public health**
- Food industry has **initiated the reformulation of food products**, but the effects on **consumers' intakes are still modest**.
- Some blocking points. **Main difficulty is related to consumer acceptance** ('healthy=not tasty intuition').
- **Debate about the need of public intervention** to improve the average nutritional quality. Comparison of the effects of voluntary commitments, minimum quality standards, tax policies.

Changes in the sugar content of food purchases : soft-drinks (France)

Soft drinks	Reformulation	New products	Consumers switching	Total effect on consumers' intakes
Sugar	-2.2%	-2.4%	4.4%	-0.1%

WP 4 – Drivers and data : primary agricultural and fisheries production

Modeling of the environmental sustainability of production systems and post-harvest handling in the EU requires detailed data.

- For agricultural land use diversity and soil erosion data was collected at high spatial resolution (Leip et al., 2017);
- Data on fisheries and aquaculture has been integrated with cropping and livestock systems;
- Waste streams and opportunities for circular use of resources quantified (Garmona-Garcia and Leip, 2017).

Livestock (D4.1)

- Description of the main drivers that might affect the future of livestock production in Europe ; **technological changes, stagnation of the demand, health and environmental issues…**

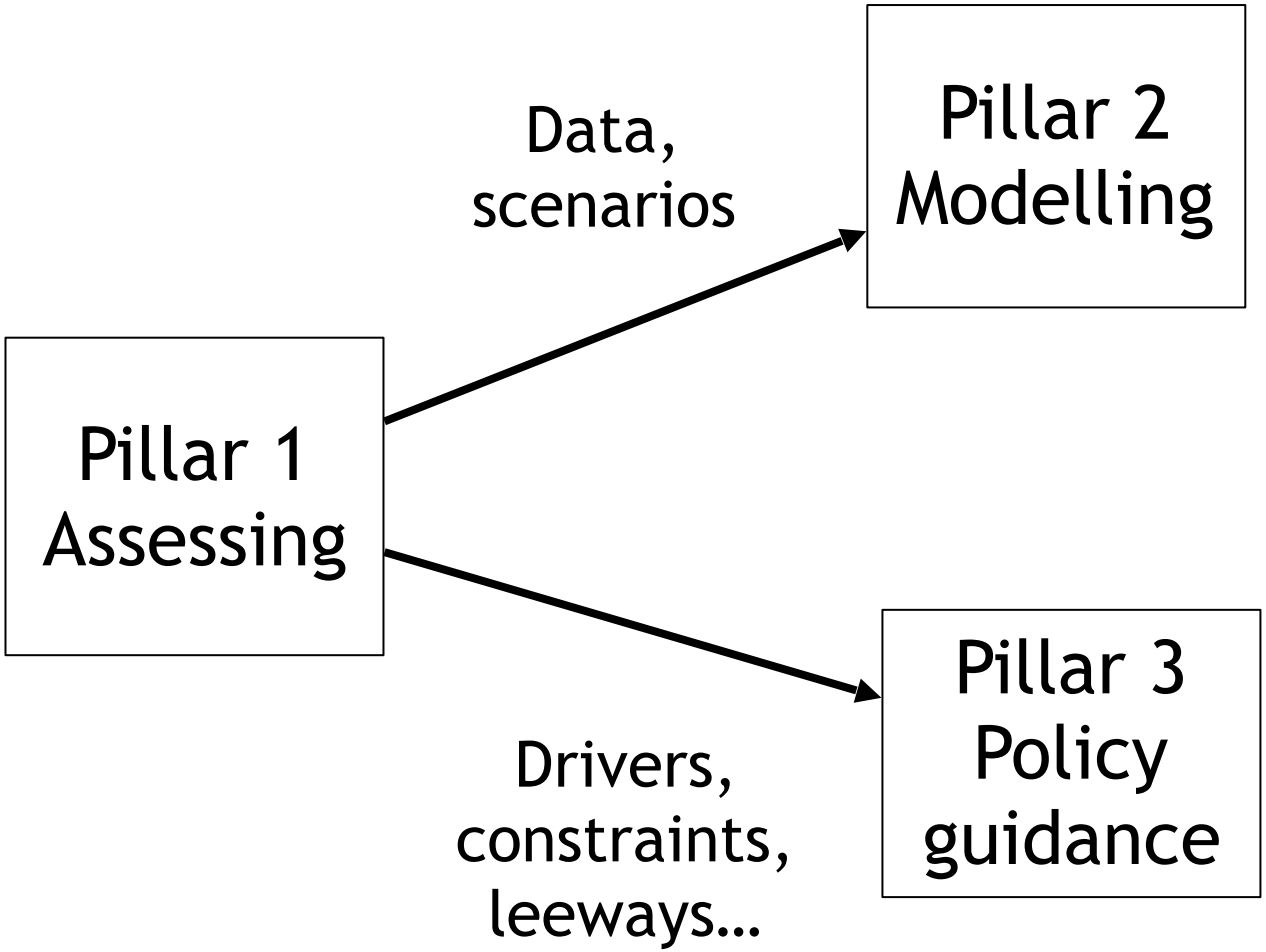
Seafood (D4.2)

- **Seafood has a major potential to contribute to sustainable FNS in the EU**. Related issues comprise of :
  - improved governance of common natural resources of seafood from capture fisheries,
  - affordability of seafood products,
  - promoting best available technology to minimize environmental impacts and resource demand

Crop productions (D4.4, D4.5)

Increased crop demand could be served by production intensification.

Insights from the econometric analyses on yield trends and efficiencies in yield exploitation intended to improve the spatial analysis and supply side reactions in CAPRI.


Pillar 2
Modelling
Data,
scenarios
Pillar 1
Assessing
Pillar 3
Policy
guidance
Drivers,
constraints,
leeways…